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Filed : July 9, 2003

REMARKS

Claim 1 has been amended. New claim 13 is added. Claims 1-13 are now pending in this application. Support for the amendments is found in the existing claims and the specification as discussed below. Accordingly, the amendments do not constitute the addition of new matter. Applicant respectfully requests the entry of the amendments and reconsideration of the application in view of the amendments and the following remarks.

Rejection under 35 U.S.C. § 102(e) (Bass US Patent No. 6,943,036)

Claims 1-2, 5-7 and 10 are rejected under 35 U.S.C. § 102 (e) as being anticipated by Bass (US Patent No. 6,943,036).

Bass discloses a method, apparatus, and computer program product for forming an addressable array of chemical moieties on a hydrophobic substrate using an inkjet head.

Bass differs from the claimed invention in teaching application of drops which are superimposed upon one another. Although Figure 5 of Bass shows the drops as overlapping, the patent specification of Bass notes at col. 9, lines 12-16, that "in FIG. 5 deposited drops 240 are shown as only somewhat overlapping for clarity, in practice the aim is to have all drops at a feature location overlap with each other completely". Accordingly, even though FIG. 5 shows the drops as overlapping, the '036 patent specifically teaches superimposition of one drop upon another. This contrasts with Applicants' Figure 1-10, the discussion of the figures at page 13, line 12 to page 14, fourth line from bottom and the present specification at page 5, line 7 which teaches spots which are adjacent rather than superimposed or completely overlapping. As further discussed on page 7, last 4 lines to page 8, line 1, the droplets are applied such that the adjacent droplets contact at their peripheries which results in spontaneous joining of the adjacent droplets to form a larger drop. Claim 1 has been amended to clarify that "the plurality of the droplets are applied at predetermined positions apart from each other", not one on top of the other as in Bass. Support for the amendment is found in the specification at page 7, line 20 to page 8, line 1; at Figures 1-8; and at page 13, line 12 to page 14, 4th line from the bottom. Clearly, the specification teaches just the opposite of Bass as the specification teaches that the droplets are applied apart from each other and may be applied as far apart as the "sum of the respective radii of the droplets" (present specification, page 7, line 21). New claim 13 is added which includes this limitation.

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The advantage of this feature is that the spots are very even and can be easily visualized. In contrast, as discussed in the present specification at page 15, first full paragraph, when a spot is formed by applying droplets at a single position, a ring-like spot is obtained which is more difficult to visualize. This problem is avoided by the practice of the claimed method.

In view of Applicant's amendments and arguments, reconsideration and withdrawal of the above ground of rejection is respectfully requested.

Rejection under 35 U.S.C. § 103(a)- Bass

Claims 3-4, 8-9 and 11-12 are rejected under 35 U.S.C. § 102(e) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Bass (US 6,943,036).

This ground of rejection is addressed by the amendment to claim 1 as discussed above and which is incorporated here. Bass do not teach all of the elements of the invention as claimed. As discussed above, Bass teach application of droplets which are completely overlapping, while Applicant has amended claim 1 to clarify that droplets, according to the method of the present specification, are applied at a distance apart. Accordingly, Bass does not teach or suggest the invention as now claimed. Claims 3-4, 8-9 and 11-12 depend from claim 1 and are patentable at least for the reasons given above.

Claims 3-4, 8-9 and 11-12 may be further distinguished from Bass. The Examiner posits that although Bass does not specify imaging a square, Bass does teach evaluation of drop dispenser errors. However, as discussed above, Bass is concerned with applying one drop over another. As discussed at col. 3, lines 19-33, the dispenser error that Bass is concerned with is when a second drop is deposited to the wrong location which is the same location as a first drop. That is, "when a first drop deposited by a first dispenser on a substrate location may be detected, it is difficult to detect a second and subsequent drops deposited at the same location" (col. 3, lines 22-25). While it is possible that the target locations may form a square (or other quadrilateral shape), the target locations of Bass correspond to the "spots" referred to in Applicant's claim 1, not the droplets. Please refer to Bass at col. 1, lines 46-49 which teaches that "multiple different reagent droplets are deposited by pulse jet or other means at a given target location in order to form the final feature". Accordingly, the concept of applying droplets in a pattern, such as a square, as discussed in the present specification at pages 9-10, bridging paragraph, pages 15-16, bridging paragraph, (referring to Figures 1-8 and 9, and 10), is not taught

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by Bass. While the finally formed array may contain features/target locations that could form a square (Figure 8 of Bass, for example) the droplets which form the target location are superimposed as discussed above. Bass does not teach or suggest droplets which are applied to circles to form target locations. Bass does not teach or suggest arranging circles/droplets and joining the circles/droplets to adjust the size of the spot.

Withdrawal of the rejection is respectfully requested.

Rejection under 35 U.S.C. § 103(a)- DeBonte '623

Claims 1-2, 5-7, and 10 are rejected under 35 U.S.C. § 103(a) as being unpatentable over William John DeBonte, et al.(GB 2157623)

The '623 application discloses a method of operating an ink jet apparatus to control dot size.

The '623 application does not teach all of the elements of the invention as claimed. The '623 application pertains to "high resolution printing" (page 1, line 6), not a method of producing a microarray. Accordingly, the '623 publication teaches application of ink to a paper substrate (page 3, lines 21-24), not the application of a "biological substance" to a "water repellent substrate" (claim 1). The Office Action does not address why one of ordinary skill in the art would be motivated to apply the teaching of the '623 application pertaining to paper and ink, to a microarray printed with biological samples. Regarding the claimed feature of a water repellent substrate, the Examiner states that "one of ordinary skill in the art at the time of the invention would envision employing the method of Williams [sic] to deposit material on a hydrophobic surface." (Office Action, page 5, first full paragraph). However, the basis for this statement is not provided. It is not clear at all that the apparatus of the '623 publication could be used with a hydrophobic surface and achieve the results reported by Applicants. It is well established that general conclusions concerning what is "basic knowledge" or "common sense" to one of ordinary skill in the art without specific factual findings and some concrete evidence in the record to support these findings will not support an obviousness rejection (see *In re Zurko*, 258 F.3d 1379 at 1386, 59 USPQ2d 1693 at 1697 (Fed. Cir. 2001)). Furthermore, although a prior art device "may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so." (*In re Mills*, 916 F.2d at 682, 16 USPQ2d at 1432).

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As discussed in the present specification at page 6, lines 10-22, the water repellency of the substrate is important in order for the droplets to coalesce to form the spot. This problem is not even addressed by the '623 publication as the '623 publication does not pertain to the formation of "spots" containing "biological samples" (claim 1). Rather the '623 publication pertains to formation of characters on paper as can be seen from Figures 10 and 11. While the Office Action refers to Figure 12, this Figure shows the formation of a line of dots which would be used to form characters as shown in Figure 11, not spots containing biological samples as claimed. Accordingly, there is no motivation in the '623 publication to form spots of biological samples on a microarray because the '623 publication pertains to formation of characters on paper. The '623 publication does not teach or suggest producing microarrays with spots containing biological samples on a water repellent substrate.

In view of Applicant's amendments and arguments, reconsideration and withdrawal of the above ground of rejection is respectfully requested.

CONCLUSION

In view of Applicants' amendments to the claims and the foregoing Remarks, it is respectfully submitted that the present application is in condition for allowance. Should the Examiner have any remaining concerns which might prevent the prompt allowance of the application, the Examiner is respectfully invited to contact the undersigned at the telephone number appearing below.

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Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

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By: Che S. Chereskin
Che Swyden Chereskin, Ph.D.
Registration No. 41,466
Agent of Record
Customer No. 20,995
(949) 721-6385

2838656
081506